CLAIMS

1. An electric current measurement device, comprising:

a housing defining a first open end and a second open end opposite said first open end,

a first sealing means having an aperture, said first sealing means having an overall geometrical configuration corresponding to the overall geometrical configuration of said first open end of said housing, said first sealing means further comprising an aperture adapted for receiving a first optical fibre,

a first fixture means for fixating said first optical fibre,

a first optical lens having a reception part adapted for receiving said first fixture means for mounting said first optical fibre in optical continuation with said first optical lens, said first optical lens mounted in said housing,

a first polarisation filter mounted in said housing in optical continuation with said first optical lens,

a glass rod received in and encapsulated within said housing in optical continuation with said first polarisation filter, said glass rod being constructed from a material having magneto-optical properties,

a second polarisation filter mounted in said housing in optical continuation with said glass rod,

a second optical lens mounted in said housing in optical continuation with said second polarisation filter, said second optical lens adapted for receiving a second fixture means,

a second fixture means for fixating a second optical fibre, said second fixture means received in said second optical lens,

a second sealing means for sealing said second end of said housing, said second sealing means having an aperture for receiving a second optical fibre, said second sealing means mounted in said second end of said housing end, and

a first and second lid adapted for fixation to said first and second end, respectively, of said housing, said first and second lid including an aperture for receiving said first and second optical fibre respectively.

2. An electric current measurement device according to claim 1 wherein:

said first and said second polarisation filters are mounted in substantially parallel relation,

polarisation planes of said first polarisation filter and said second polarisation filter are rotated 45°, respectively.

3. An electric current measurement device according to any of the preceding claims,

said glass rod being made from SF6.

4. An electric current measurement device according to any of the preceding claims,

said housing being made from a material exhibiting optical non-transparency within the range at least 400 nm to 1000 nm.

5. An electric current measurement device according to any of the preceding claims,

said housing being made from Ulterm, alternatively Peek.

6. An electric current measurement device according to any of the preceding claims, said current measurement device further comprising:

a groove in said housing, said groove formed in said housing and having a width corresponding to the length of said glass rod mounted in said housing, alternatively, said groove being adapted for receiving an electrical conductor.

7. An electric current measurement device according to any of the preceding claims, said current measurement device further comprising:

at least one wing extending from said housing, said wing enabling said housing to be mounted on a oblong electrical conductor.

8. A system for measuring high voltage current an electrical conductor, said system comprising:

a light source, said light source being an LED based light source, alternatively an incandescent light source,

a first optical conduit being a first optical fibre, said first optical conduit conducting light emitted from said light source,

an optical electric current measurement device comprising:

a housing defining a first open end and a second open end opposite said first open end,

a first sealing means having an aperture, said first sealing means having an overall geometrical configuration corresponding to the overall geometrical configuration of said first open end of said housing, said first sealing means further comprising an aperture adapted for receiving said first optical fibre,

a first fixture means for fixating said first optical fibre,

a first optical lens having a reception part adapted for receiving said first fixture means for mounting said first optical fibre in optical continuation with said first optical lens, said first optical lens mounted in said housing,

a first polarisation filter mounted in said housing in optical continuation with said first optical lens,

a glass rod received in and encapsulated within said housing in optical continuation with said first polarisation filter, said glass rod being constructed from a material having magneto-optical properties,

a second polarisation filter mounted in said housing in optical continuation with said glass rod,

a second optical lens mounted in said housing in optical continuation with said second polarisation filter, said second optical lens adapted for receiving a second fixture means,

a second fixture means for fixating a second optical fibre, said second fixture means received in said second optical lens,

a second sealing means for sealing said second end of said housing, said second sealing means having an aperture for receiving a second optical fibre, said second sealing means mounted in said second end of said housing end, and

a first and second lid adapted for fixation to said first and second end, respectively, of said housing, said first and second lid including an aperture for receiving said first and second optical fibre respectively, said optical electric current measurement device receiving said light from said first optical conduit,

a second optical conduit being said second optical fibre, said second optical conduit receiving said light emitted from said optical electric current measurement device,

a detection means for detecting said light emitted from said second optical conduit and converting said received light to an electrical signal,

a processing means for processing said electrical signal from said detection means so as to determine said high voltage current in said electrical conductor,

a current measurement system for performing calibration measurements for said system, and

a first communications means.

9. A system for measuring high voltage current in electrical conductors according to claim 8, said system further comprising:

a computer connected to a second communication means, said computer located in a central location, and

said computer including a interface for communicating status of a system for measuring high voltage current in electrical conductors to an operator.

10. A system for measuring high voltage current in electrical conductors according to claim 8, wherein:

said first and second communication means being a communications network, such as the Internet, a local area network, a wireless local area network, a wide area network, a global area network or a publicly switch telephone network,

alternatively said first and said second communication means constituted by a fixed wireless network.

11. A method of measuring high voltage current in electrical conductors, said method comprising:

providing a light source, said light source being an LED based light source, alternatively an incandescent light source,

providing a first optical conduit being a first optical fibre, said first optical conduit conducting light emitted from said light source,

providing an optical electric current measurement device comprising:

a housing defining a first open end and a second open end opposite said first open end,

a first sealing means having an aperture, said first sealing means having an overall geometrical configuration corresponding to the overall geometrical configuration of said first open end of said housing, said first sealing means further comprising an aperture adapted for receiving said first optical fibre,

a first fixture means for fixating said first optical fibre,

a first optical lens having a reception part adapted for receiving said first fixture means for mounting said first optical fibre in optical continuation with said first optical lens, said first optical lens mounted in said housing,

a first polarisation filter mounted in said housing in optical continuation with said first optical lens,

a glass rod received in and encapsulated within said housing in optical continuation with said first polarisation filter, said glass rod being constructed from a material having magneto-optical properties,

a second polarisation filter mounted in said housing in optical continuation with said glass rod,

a second optical lens mounted in said housing in optical continuation with said second polarisation filter, said second optical lens adapted for receiving a second fixture means,

a second fixture means for fixating a second optical fibre, said second fixture means received in said second optical lens,

a second sealing means for sealing said second end of said housing, said second sealing means having an aperture for receiving a second optical fibre, said second sealing means mounted in said second end of said housing end, and

a first and second lid adapted for fixation to said first and second end, respectively, of said housing, said first and second lid including an aperture for receiving said first and second optical fibre respectively,

said optical electric current measurement device receiving said light from said first optical conduit,

a second optical conduit being said second optical fibre, said second optical conduit receiving said light emitted from said optical electric current measurement device,

providing a detection means for detecting said light emitted from said second optical conduit and converting said received light to an electrical signal,

providing a processing means for processing said electrical signal from said detection means,

providing a current measurement system for performing calibration measurements for said system, and

providing a first communications means.

12. A method according to claim 11, said method further comprising:

proving a computer connected to a second communication means, said computer located in a central location, and

said computer including a interface for communicating status of a system for measuring high voltage current in electrical conductors to an operator.

13. A method according to claim 11, wherein:

said first and second communication means being a communications network, such as the Internet, a local area network, a wireless local area network, a wide area network, a global area network or a publicly switch telephone network,

alternatively said first and said second communication means constituted by a fixed wireless network.

14. A method of calibrating a system for measuring high voltage current in electrical conductors, said method comprising:

providing an electrical conductor carrying high voltage current,

providing a light source,

providing a first optical conduit defining a first and a second opposite end, said light source connected to said first end of said first optical conduit, said light source emitting light into said first optical conduit,

providing a Faraday current measurement device defining a first and a second opposite end, said first end of said Faraday current measurement device connected to said second end of said first optical conduit, said Faraday current measurement device receiving said light from said first optical conduit,

providing a second optical conduit, defining a first and a second opposite end, said first end connected to said second end of said Faraday current measurement device,

providing an optical detection means for converting said light to an electrical signal, said optical detection means connected to said second end of said second optical conduit,

providing a current measurement system performing a measurement of the current in said electrical conductor,

performing said measurement of said electrical current in said electrical conductor, said system for measuring high voltage current in electrical conductors calculating a calibration constant, removing said current measurement system.

15. A method according to claim 14, said method further comprising:

said system for measuring high voltage current in electrical conductors periodically, alternatively aperiodically, recalculating said calibration constant by measuring the AC and DC components of said electrical signal.

16. A method according to any of the claims 14 or 15, said method further comprising the steps of initially determining the DC component of said optical signal, then periodically determining the DC component of said optical signal,

determining the actual AC component by multiplying the measured AC component with the ratio of said initially determined DC component and said periodically determinated DC component.

17. A method according to any of the claims 14 or 15, wherein said Faraday current measurement device is a device according to any of the claims 1 to 7.